election than their knowledge of or interest in the poor. Accordingly their administration is often faulty and ill-informed; and the Commissioners direct attention to many cases in which the allowances made by the guardians are helping to perpetuate social and moral conditions of the worst type. Even when the relief is given to the right people, it is too often inadequate in amount, and ill-adapted to the particular needs of the case.

The object of the Commissioners, therefore, is to ensure that henceforth the local public assistance authority shall be largely nominated from amongst men and women of experience, wisdom, and unselfish devotion to the public good, and shall be served by officers fully qualified by knowledge and by experience. For the higher offices it is suggested that there should be qualifying examinations, and highly trained officers will be required in what are now regarded as less important posts, *e.g.* that of labour master. For these purposes a graded public assistance service should be set up, which should include all officers concerned with the supervision, control, and disciplinary treatment of the poor, both male and female. In this service there should be more opportunity of promotion from the lower to the higher ranks, and no question of superannuation should hinder the transfer of efficient and promising officers from one local authority to another.

The recommendations of the Commissioners tend not merely to securing better qualified administrators, but also to the adoption of sound principles, which we may fairly define as scientific, in the distribution of public assistance. For example, the principle of classification is insisted upon, in institutions adapted to the various needs of the dependent poor, in lieu of the aggregation of all classes in the present workhouses. For those trespassers on public hospitality called " ins-and-outs " a system of detention should be adopted. Outdoor relief should be administered under those conditions of strict investigation and adaptation to the particular needs of the individual which are expressed in the term " case-work," and in such a manner as to strengthen the hands of sanitary authorities, and to elicit the support and cooperation of voluntary aid committees. The aged should be adequately relieved, and their comfort and happiness considered. Many recommendations are made as to the care, education, and medical supervision of children. The detention of feeble-minded, idle, and immoral paupers is recommended, and is a step which may help to the solution of a problem in eugenics.

Among the questions dealt with in this report for the determination of which the scientific spirit is essential, that of the relation of public assistance to voluntary aid—that is to say, of the relative functions of the community, of the charitable individual, and of the charitable foundation in the relief of distress—is one of the most important. Its consideration occupies eighty folio pages of the report, and we are glad to know that it has not been omitted from the programme of the British Science Guild, which has, at the suggestion of Sir William Bousfield, appointed a committee to work out this problem. The report will supply materials of great value to that committee. It bears testimony to the good results obtained by the labours of charity organisation societies in all parts of the country, which have long been imbued with that spirit; and it leads to nineteen specific recommendations, too minute to be referred to in detail, which justify the hope that that spirit will govern the administration of public aid and of charity in the future.

The report of the four members of the Commission who found themselves unable to sign that agreed to by their fourteen colleagues also confirms the views we have endeavoured to express. It declares the breaking up of the present unscientific category of the aged and infirm, and the substitution of a method of dealing separately with distinct classes according to the age and the mental and physical characteristics of the individuals concerned, to be a necessary preliminary of any effective reform.

Other problems which are discussed in these able documents require actuarial science for their solution, as, for example, the distress due to unemployment, invalidity assurance, old age pensions, friendly societies and trade unions, and the other provident institutions which have been so marvellously efficient as prophylactics against pauperism; but space will not allow of further discussion. Enough if we have shown the place of the scientific spirit in dealing with a great social and economic question.

THE METEORIC FIREBALL OF FEBRUARY 22 AND ITS STREAK.

ONE of the most notable meteors of recent years appeared on February 22 at 7.30 p.m., and was observed from the southern counties of England. It was a brilliant object, at first emitting an orange light, varying in intensity, then when about half its flight had been performed it suddenly blazed out with a steely-blue lustre and lit up the foggy atmosphere as though a huge rocket had exploded. It left a short, luminous streak where the chief outburst occurred, but this streak immediately intensified and soon extended along the whole path traversed by the meteor. Becoming bent and contorted, it assumed a variety of shapes and drifted to north-west under the action of upper wind currents. Diffusing itself into a broad, faint band of irregular form, it was ultimately lost amid the Milky Way about two hours after the time of its first projection. The long duration of the streak is almost without parallel in this country, though the Madrid meteorite of 1896 February 10 left a luminous band or cosmic cloud visible in the sky for 5½ hours!

The meteor of February 22 was a Leonid, but the radiant is not quite accurately defined, as the flight of the object was very similar at most of the stations, for it slightly descended from Canis Minor to the southern region of Orion. But there is no doubt that the direction was from Leo, and the point of radiation seems well indicated at $175^\circ+16^\circ$ near β Leonis. Just possibly the radiant may have been at $155^\circ+12^\circ$, for I saw a fairly bright meteor on the same night passing slowly from $150^\circ+40^\circ$ to $148^\circ+49^\circ$, and directed from this centre 5° E. of Regulus. The height of the large meteor was from about sixty to twenty-six miles over the English Channel, about forty miles south of the coasts of Sussex, Hampshire, and Dorset. The luminous course was about 135 miles in length, and the velocity 20 miles per second. Several observations indicate a greater length of path and a lower elevation (22 miles) at the end, vertically over a point 50 miles S. of Plymouth. The best estimates for the duration of flight are 5–6 secs., 6–7 secs., and 8 secs. The fireball of 1898 February 20 had a radiant at $177^\circ+12^\circ$, and probably belonged to the same system.

As to the trail, at 8h. 12m. one trustworthy observer says the whole length of it was 100°; another gives 180°. Many excellent observations are to hand, and it may be possible to work out some interesting details concerning the velocity and direction of its drift. The great changes which affected it will, however, make this difficult. One bright bend in the luminous

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material moved to N.W. at a rate of eighty miles per hour, and appears to have retained approximately the same height of thirty-two miles while it travelled from over a point N. of Alderney Island to over Dartmoor. The streak of the fireball of 1894 August 26 moved to S.E. at a rate of 120 miles per hour, and was about fifty-one miles high. In fact, meteoric streaks from the swifter class of objects, such as Leonids, Perseids, and Orionids, are usually between fifty and sixty miles high. The streak or smouldering residue of the February 22 fireball was much lower than this, though the earlier portions of it exceeded fifty miles in height.

The burning or phosphorescence of the meteoric débris for so long a period after dispersion is remarkable. Moonlight could hardly have produced the effect, as our satellite was only 2¼ days old (setting at 8h. 19m.) and reflected little light. I have never observed meteor streaks to have a lengthened existence in the presence of the full moon, so that another cause inherent in the glowing material must be found for its extraordinary sustenance in the recent case. There must have been something special in its composition or in the condition of the air at the time.

I have received seventy-one observations of the meteor or of its trail, and other descriptions of very useful character ought to come from Havre, Cherbourg, and other places on the north coast of France and from the Channel Islands.

The phenomenon may be aptly described as *the* meteoric spectacle of a generation. As the nucleus sailed along its nearly horizontal course, its light was far from being even. It gave a series of outbursts, the brighter of which much exceeded the lustre of Venus. This comparison applies to a distance of 100 miles. The mate of a vessel in the Channel near Start Point says the light was astonishing, and broke out with startling vividness, so that anyone could have easily seen to read.

At the end of the meteor's flight it seemed to turn abruptly in its direction, and fragments or embers fell almost vertically earthwards about 3°. Then the trail bent to the east and extended rapidly in a horizontal path. The rate of this easterly drift, as seen at Dunstable, Farnham, and other places, was shown on drawings, and appears to have been more than 300 miles per hour, the visible length having increased about eighty miles between 7h. 30m. and 7h. 45m. Something more than mere wind currents would appear to have been instrumental in inducing this rapid translation. The easterly streak appears, in fact, to have occupied at 7.45 the place where the original train existed at 7.30, but which had risen about 20° a quarter of an hour later.

The nucleus of the meteor as it traversed its course threw off a train of fiery sparks, such as is often seen, but these quickly died away. Then slowly the durable streak or trail came out, intensifying rapidly and stretching across the sky like a silver ribbon very irregularly arranged. By one observer in the Channel it was watched for three hours, until it became faintly blended with the Milky Way in Cepheus and Cygnus.

The bend in the path of the fireball at the limits of its westerly flight and the remarkable streak which quickly formed far to the east are curious. It has been suggested that there may have been a second meteor responsible for the lower streak stretching to the eastward. But as hundreds of persons were watching the sky, it would have been and reported had it been visible. At the termination of the meteor's career it evidently suffered disruption by two violent explosions, the places of which were definitely marked by brilliant condensations at the angles of the bent streak. Is it possible that on the bursting and disintegration of the mass one large fragment was hurled in a direction nearly opposite to that of the original course? The resistance of the air at the comparatively low altitude of the meteor must have been considerable in checking its velocity, but some more potent influence must have suddenly stayed the westerly rush of the object, diverted it or its material earthwards, and then, as abruptly, dispersed it far and rapidly eastwards.

W. F. Denning.

NOTES.

The following fifteen candidates have been selected by the council of the Royal Society to be recommended for election into the society:—Mr. E. C. C. Baly, Sir Thomas Barlow, Bart., Rev. E. W. Barnes, Dr. F. A. Bather, Sir Robert A. Hadfield, Mr. A. D. Hall, Dr. A. Harden, Mr. A. J. Jukes-Browne, Prof. J. G. Kerr, Prof. W. J. Lewis, Prof. J. A. McClelland, Prof. W. McFadden Orr, Dr. A. B. Rendle, Prof. J. Lorrain Smith, and Prof. J. T. Wilson.

The *Times* announces that a well-equipped aërodynamic laboratory is about to be established by the Aéro Club de France with the assistance of the State. It is computed that more than 5000*l.* will be required to start this project, the utility of which is unquestioned. Practical tests in planes, propellers, engines, &c., will be carried out at this laboratory.

The seventh annual session of the South African Association for the Advancement of Science will be held at Bloemfontein during the week ending October 2, under the presidency of Sir Hamilton J. Goold-Adams, K.C.M.G. The assistant general secretary is Mr. E. Hope Jones, P.O. Box 1497, Cape Town.

The sixth International Psychological Conference will be held at Geneva from August 3 to 8 next. An exhibition is being arranged, and a special section is to be devoted to animal psychology. M. E. Claparède, 11 avenue de Champel, Geneva, is the general secretary, and M. Cellerier, Montchoisy, Geneva, is the treasurer.

The Paris correspondent of the *Daily Chronicle* states that the wireless telegraph station on the Eiffel Tower has been receiving messages from the station at Glace Bay, Canada, a distance of 3250 miles. A new installation is being fitted at the Eiffel Tower, by means of which it is hoped to establish wireless telegraphic communication with Saigon (Cochin China), a distance of 6800 miles.

On Thursday next, March 11, Mr. A. D. Hall will begin a course of two lectures at the Royal Institution on "Recent Advances in Agricultural Science." The Friday evening discourse on March 12 will be delivered by Mr. S. G. Brown on "Modern Submarine Telegraphy," and on March 19 by Mr. R. Threlfall, F.R.S., on "Experiments at High Temperatures and Pressures."

The Berlin correspondent of the *Times* announces the death of Prof. H. Ebbinghaus, professor of philosophy at the University of Halle, at fifty-nine years of age. Prof. Ebbinghaus contributed extensively to the *Zeitschrift für Psychologie,* of which he was the founder, while of his several books the best known are his work "On the Memory" (1885), and the first volume, which appeared three years ago, of the unfinished "Principles of Psychology."

An exhibition of optical and ophthalmological appliances will be held in the rooms of the Medical Society of London on March 12 and 13, from noon to 10 p.m. each day.

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